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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/808,796	03/15/2001	Karl Beeson	30-3818 DIV-2 (4370)	6658

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EXAMINER	
LUK, EMMANUEL S	
ART UNIT	PAPER NUMBER
1722	

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/808,796	Applicant(s) BEESON ET AL.	
	Examiner Emmanuel S. Luk	Art Unit 1722	

-- The MAILING DATE of this communication appears on the cover sheet with the c rrespondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-33,35-38,42 and 57-67* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-33,35-38,42 and 57-67* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 22-30, 35, 36 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al in view of Rendulic et al.

Takahashi teaches a transparent plate (1), such as a glass plate (col. 15, lines 27), a liquid photosensitive resin composition is placed on the substrate (Col. 15, lines 31), a transparent substrate (5) is placed, and a light source (7) is applied to cure a portion of the resin (Col. 16, lines 15-22), the uncured portion is removed via nozzle washing or brush washing using a wash-out solution (Col. 16, lines 28-31). Takahashi also teaches types of resins that can be used including oligomers, monomers, polymers (Col. 4 to Col. 14), and photoinitiators (Col. 3, line 20).

The glass plate is also the amorphous inorganic substrate that the resin rests upon.

Takahashi fails to teach a collimated light source and angle of divergence not more than 10 degrees and the light provides more than one dose and an array of optical wave guides with lenticular elements juxtaposed with polymerizable materials.

Rendulic teaches an apparatus for producing printed circuit boards wherein polymers are coated onto a board and a light is applied for curing the polymer. The light source providing collimated light (Col. 7, line 4) with an angle of deviation not more than 3 degrees and preferably not more than 1.5 degrees (Col. 7, lines 6-10).

In regards to the dose, the light can be increased to provide more than one dose, this is an intended use of light source in the apparatus.

It would have been obvious to one of ordinary skill in the art to modify Takahashi with the collimated light and angle of divergence not more than 10 degrees as taught by Rendulic because it provides uniformity and accuracy.

Zimmerman teaches a waveguide comprising of a lenticular array that light transmitting since typical problems of collimated light sources are non-uniform light distribution, lack of a controlled directional output of light, inefficiencies with regard to the amount of the collimated light output versus the amount of the non-collimated light input, and the lack of an efficient collimated light source in a compact design or narrow profile (Col. 1, lines 25-32). The positioning for the optical waveguide in relation to the substrates would have been obvious to one skilled in the art to have it juxtaposed in order for the waveguide to function.

It would have been obvious to one of ordinary skill in the art to modify Takahashi with an optical waveguide as taught by Zimmerman because it allows for improved transmission of radiation for curing on the polymerizable layer.

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Zimmerman et al

(5739931) at the time this invention was made. Accordingly, Zimmerman et al (5739931) is disqualified as prior art through 35 U.S.C. 102(e), (f) or (g) in any rejection under 35 U.S.C. 103(a) in this application. However, this applied art additionally qualifies as prior art under another subsection of 35 U.S.C. 102 and accordingly is not disqualified as prior art under 35 U.S.C. 103(a).

3. Claims 57-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al in view of Rendulic et al and Zimmerman et al.

Takahashi teaches a transparent plate (1), such as a glass plate (col. 15, lines 27), a liquid photosensitive resin composition is placed on the substrate (Col. 15, lines 31), a transparent substrate (5) is placed, and a light source (7) is applied to cure a portion of the resin (Col. 16, lines 15-22), the uncured portion is removed via nozzle washing or brush washing using a wash-out solution (Col. 16, lines 28-31). Takahashi also teaches types of resins that can be used including oligomers, monomers, polymers (Col. 4 to Col. 14), and photoinitiators (Col. 3, line 20).

The glass plate is also the amorphous inorganic substrate that the resin rests upon.

Takahashi fails to teach a collimated light source and angle of divergence not more than 10 degrees and the light provides more than one dose and an array of optical wave guides with lenticular elements juxtaposed with polymerizable materials.

Rendulic teaches an apparatus for producing printed circuit boards wherein polymers are coated onto a board and a light is applied for curing the polymer. The light

source providing collimated light (Col. 7, line 4) with an angle of deviation not more than 3 degrees and preferably not more than 1.5 degrees (Col. 7, lines 6-10).

In regards to the dose, the light can be increased to provide more than one dose, this is an intended use of light source in the apparatus.

Zimmerman teaches a waveguide comprising of a lenticular array that light transmitting since typical problems of collimated light sources are non-uniform light distribution, lack of a controlled directional output of light, inefficiencies with regard to the amount of the collimated light output versus the amount of the non-collimated light input, and the lack of an efficient collimated light source in a compact design or narrow profile (Col. 1, lines 25-32). The positioning for the optical waveguide in relation to the substrates would have been obvious to one skilled in the art to have it juxtaposed in order for the waveguide to function.

It would have been obvious to one of ordinary skill in the art to modify Takahashi with the collimated light and angle of divergence not more than 10 degrees as taught by Rendulic because it provides uniformity and accuracy and an optical waveguide as taught by Zimmerman because it allows for improved transmission of radiation for curing on the polymerizable layer.

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Zimmerman et al (5739931) at the time this invention was made. Accordingly, Zimmerman et al (5739931) is disqualified as prior art through 35 U.S.C. 102(e), (f) or (g) in any rejection under 35 U.S.C. 103(a) in this application. However, this applied art additionally

qualifies as prior art under another subsection of 35 U.S.C. 102 and accordingly is not disqualified as prior art under 35 U.S.C. 103(a).

4. Claim 67 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi in view of Rendulic as applied to claim 57-63 above, and further in view of Savant et al.

Takahashi fails to teach a smooth bumps 1-20 μm on the surface.

Savant teaches a submaster (10) that can be made of metal that can be brought into contact with the resin layer (30) for transferring the surface topography. The fill material is the index matching fluid (50) that can be at least partially transmissive, it can be acrylic based epoxy for purpose of providing clarity, and can be a mixture of two or more components. The index of refraction being more than that of the photopolymerizable material is a result-effect variable that can be determined through experimentation. In regards to the shape of surface being smooth bumps between 1-20 μm, Savant teaches the shape of the surface topography is composed of isosceles triangular prisms with a depth between 0.2 μm to 200 μm. It would have been obvious to one of ordinary skill in the art to modify Savant to merely change the shape to allow for smooth bumps in the surface instead of the triangular prisms formed.

It would have been obvious to one of ordinary skill in the art to modify Takahashi to produce a surface as taught by Savant because it allows for the desired shape and depth on the surface of the resin layer.

5. Claim 64 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takahashi et al in view of Rendulic et al.

Takahashi teaches a transparent plate (1), such as a glass plate (col. 15, lines 27), a liquid photosensitive resin composition is placed on the substrate (Col. 15, lines 31), a transparent substrate (5) is placed, and a light source (7) is applied to cure a portion of the resin (Col. 16, lines 15-22), the uncured portion is removed via nozzle washing or brush washing using a wash-out solution (Col. 16, lines 28-31). Takahashi also teaches types of resins that can be used including oligomers, monomers, polymers (Col. 4 to Col. 14), and photoinitiators (Col. 3, line 20).

The glass plate is also the amorphous inorganic substrate that the resin rests upon.

Takahashi fails to teach a collimated light source and metal layer and a smooth bumps 1-20 μm on the surface.

Rendulic teaches an apparatus for producing printed circuit boards wherein polymers are coated onto a board and a light is applied for curing the polymer. The light source providing collimated light (Col. 7, line 4) with an angle of deviation not more than 3 degrees and preferably not more than 1.5 degrees (Col. 7, lines 6-10).

Savant teaches a submaster (10) that can be made of metal that can be brought into contact with the resin layer (30) for transferring the surface topography. The fill material is the index matching fluid (50) that can be at least partially transmissive, it can be acrylic based epoxy for purpose of providing clarity, and can be a mixture of two or more components. The index of refraction being more than that of the

photopolymerizable material is a result-effect variable that can be determined through experimentation. In regards to the shape of surface being smooth bumps between 1-20 μm, Savant teaches the shape of the surface topography is composed of isosceles triangular prisms with a depth between 0.2 μm to 200 μm. It would have been obvious to one of ordinary skill in the art to modify Savant to merely change the shape to allow for smooth bumps in the surface instead of the triangular prisms formed.

It would have been obvious to one of ordinary skill in the art to modify Takahashi with the collimated light as taught by Rendulic because it provides uniformity and accuracy and to produce a surface as taught by Savant because it allows for the desired shape and depth on the surface of the resin layer.

6. Claims 22-30, 35, 36 and 42 rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura et al in view of Rendulic et al and Zimmerman.

Matusumura et al teaches a glass substrate (1), a transparent electroconductive layer (2), containing tin oxide, indium oxide and the like (Col. 2, lines 7-9), a photosensitive layer (3), a mask (4), the resin comprising of polymer resins, exposure of a light source for curing (Col. 4, lines 38-40) and th substrate is washed rinsed in water to remove the resin (Col. 4, lines 50-53).

Matsumura fails to teach a collimated light source and angle of divergence not more than 10 degrees and the light provides more than one dose and an array of optical wave guides with lenticular elements juxtaposed with polymerizable materials.

Rendulic teaches an apparatus for producing printed circuit boards wherein polymers are coated onto a board and a light is applied for curing the polymer. The light source providing collimated light (Col. 7, line 4) with an angle of deviation not more than 3 degrees and preferably not more than 1.5 degrees (Col. 7, lines 6-10).

In regards to the dose, the light can be increased to provide more than one dose, this is an intended use of light source in the apparatus.

Zimmerman teaches a waveguide comprising of a lenticular array that light transmitting since typical problems of collimated light sources are non-uniform light distribution, lack of a controlled directional output of light, inefficiencies with regard to the amount of the collimated light output versus the amount of the non-collimated light input, and the lack of an efficient collimated light source in a compact design or narrow profile (Col. 1, lines 25-32). The positioning for the optical waveguide in relation to the substrates would have been obvious to one skilled in the art to have it juxtaposed in order for the waveguide to function.

It would have been obvious to one of ordinary skill in the art to modify Matsumura with the collimated light and angle of divergence not more than 10 degrees as taught by Rendulic because it provides uniformity and accuracy and an optical waveguide as taught by Zimmerman because it allows for improved transmission of radiation for curing on the polymerizable layer.

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the inventor of this application,

and is therefore, not the invention "by another", or by antedating the applied art under 37 CFR 1.131.

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Zimmerman et al (5739931) at the time this invention was made. Accordingly, Zimmerman et al (5739931) is disqualified as prior art through 35 U.S.C. 102(e), (f) or (g) in any rejection under 35 U.S.C. 103(a) in this application. However, this applied art additionally qualifies as prior art under another subsection of 35 U.S.C. 102 and accordingly is not disqualified as prior art under 35 U.S.C. 103(a).

7. Claim 66 rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumara in view of Rendulic et al as applied to claim 42 above, and further in view of Savant et al.

Matsumara fails to teach a smooth bumps 1-20 μm on the surface.

Savant teaches a submaster (10) that can be made of metal that can be brought into contact with the resin layer (30) for transferring the surface topography. The fill material is the index matching fluid (50) that can be at least partially transmissive, it can be acrylic based epoxy for purpose of providing clarity, and can be a mixture of two or more components. The index of refraction being more than that of the photopolymerizable material is a result-effect variable that can be determined through experimentation. In regards to the shape of surface being smooth bumps between 1-20 μm, Savant teaches the shape of the surface topography is composed of isosceles

triangular prisms with a depth between 0.2 μm to 200 μm. It would have been obvious to one of ordinary skill in the art to modify Savant to merely change the shape to allow for smooth bumps in the surface instead of the triangular prisms formed.

It would have been obvious to one of ordinary skill in the art to modify Matsumara to produce a surface as taught by Savant because it allows for the desired shape and depth on the surface of the resin layer.

8. Claims 31-33, 37-41 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumura in view of Rendulic as applied to claims 22-30, 35, 36 and 42 above, and further in view of Savant et al and Zimmerman.

Matsumura teaches the claimed apparatus as shown above.

Matsumura fails to teach a metallic layer for embossing, light scattering particles in the embossable material and an array of optical wave guides with lenticular elements juxtaposed with polymerizable materials.

Savant teaches a submaster (10) that can be made of metal that can be brought into contact with the resin layer (30) for transferring the surface topography. The fill material is the index matching fluid (50) that can be at least partially transmissive, it can be acrylic based epoxy for purpose of providing clarity, and can be a mixture of two or more components. The index of refraction being more than that of the photopolymerizable material is a result-effect variable that can be determined through experimentation. In regards to the shape of surface being smooth bumps between 1-20

μm, Savant teaches the shape of the surface topography is composed of isosceles triangular prisms with a depth between 0.2 μm to 200 μm. It would have been obvious to one of ordinary skill in the art to modify Savant to merely change the shape to allow for smooth bumps in the surface instead of the triangular prisms formed.

Zimmerman teaches a waveguide comprising of a lenticular array that light transmitting since typical problems of collimated light sources are non-uniform light distribution, lack of a controlled directional output of light, inefficiencies with regard to the amount of the collimated light output versus the amount of the non-collimated light input, and the lack of an efficient collimated light source in a compact design or narrow profile (Col. 1, lines 25-32). The positioning for the optical waveguide in relation to the substrates would have been obvious to one skilled in the art to have it juxtaposed in order for the waveguide to function.

It would have been obvious to one of ordinary skill in the art to modify Takahashi with an optical waveguide as taught by Zimmerman because it allows for improved transmission of radiation for curing on the polymerizable layer and a metallic layer for embossing a resin with a specific surface topography and the addition of a fill layer as taught by Savant because it allows for producing replicas.

Applicant may overcome the applied art either by a showing under 37 CFR 1.132 that the invention disclosed therein was derived from the inventor of this application, and is therefore, not the invention "by another", or by antedating the applied art under 37 CFR 1.131.

Applicant has provided evidence in this file showing that the invention was owned by, or subject to an obligation of assignment to, the same entity as Zimmerman et al (5739931) at the time this invention was made. Accordingly, Zimmerman et al (5739931) is disqualified as prior art through 35 U.S.C. 102(e), (f) or (g) in any rejection under 35 U.S.C. 103(a) in this application. However, this applied art additionally qualifies as prior art under another subsection of 35 U.S.C. 102 and accordingly is not disqualified as prior art under 35 U.S.C. 103(a).

Response to Arguments

9. Applicant's arguments filed 7/11/03 have been fully considered but they are not persuasive. The applicants have argued that the prior art references, Matsumura, Takahashi and Rendulic, are from different fields and cannot be combined. However, both references are in fact related to the field of photocuring resin material upon a layer. Thus, it is obvious to one skilled in the art to combine the prior art references in the rejection. In regards to Zimmerman, the prior art reference remains in the rejection since it is not disqualified as a prior art under 35 U.S.C. 103(a).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel S. Luk whose telephone number is (703) 305-1558. The examiner can normally be reached on Monday through Friday 8 to 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on (703) 308-0457. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

E.L.

Walker

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